



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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April 20, 2016

Mr. Patrick Gillooly
MATEP Limited Partnership
474 Brookline Avenue
Boston, MA 02215

RE: **BOSTON**
Transmittal No.: X259947
Application No.: NE-14-013
Class: OP 119
FMF No. 341192; RO No. 341194
**PROPOSED AIR QUALITY
PLAN APPROVAL – issued for
public comment and hearing**

Dear Mr. Gillooly:

The Massachusetts Department of Environmental Protection (MassDEP), Bureau of Air and Waste, has reviewed the Major Comprehensive Plan Application (Application) listed above, dated August 26, 2014, which was submitted by and on behalf of MATEP Limited Partnership (MATEP LP). This Application concerns the construction and operation of a 14.4 megawatt (MW) nominal combined heat and power (CHP) combustion turbine/heat recovery steam generator (Project) to be located at 474 Brookline Avenue in Boston, Massachusetts, the location of your existing combined heat and power generating facility. The Application bears the seal and signature of Andrew Jablonowski, P.E., Massachusetts Registered Professional Engineer number 39123, from Epsilon Associates, Inc. As a result of MassDEP's review of the Application, the MassDEP issued a Technical Deficiency Letter, dated September 11, 2015 to address several technical deficiencies that included startup and shutdown limits for the subject air pollutants and a complete Best Available Control Technology analysis. This Application was supplemented by a Response to Technical Deficiencies, dated September 30th, and several other clarifications through March 16th, 2016.

MATEP LP's Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control" regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-E, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TTY# MassRelay Service 1-800-439-2370
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MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this Proposed Plan Approval for said Application, as submitted, subject to the conditions listed below.

This Proposed Plan Approval allows for construction and operation of the Project, and provides information on the Project description, emission control systems, emissions limits, Continuous Emissions Monitoring Systems (CEMS), Continuous Opacity Monitoring Systems (COMS), monitoring/testing, record keeping, and reporting requirements.

On April 11, 2011, MassDEP and the U.S. Environmental Protection Agency Region 1 (EPA) executed an “Agreement for Delegation of the Federal PSD program by EPA to MassDEP” (PSD Delegation Agreement). This PSD Delegation Agreement directs that all Permits issued by MassDEP under the Agreement follow the applicable procedures in 40 CFR 52.21 and 40 CFR Part 124 regarding permit issuance, modification and appeals. MATEP LP’s Project triggers PSD review for PM_{2.5}, PM₁₀ and Greenhouse Gases (CO_{2e}). MassDEP is concurrently issuing a separate Draft PSD Permit and Draft PSD Fact Sheet for the Project.

The Draft Fact Sheet for the Draft PSD Permit is attached to this Proposed Plan Approval. This Draft Fact Sheet also explains MassDEP’s evaluation of Best Available Control Technology (BACT) for emissions of pollutants subject to PSD review and air quality impacts. The New Source Review (NSR) pollutant(s), particulates (PM_{2.5} and PM₁₀) and Greenhouse Gases/carbon dioxide (CO_{2e}) are subject to PSD review, a subset of the air contaminants subject to BACT in this Proposed Plan Approval, along with air quality impacts and other special considerations of PSD review.

MassDEP has reviewed the BACT analyses provided in the Application and has established the BACT emission rates for the PSD and non-PSD subject pollutants that are regulated by this Plan Approval including: nitrogen oxides (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter (PM/PM₁₀/PM_{2.5}), sulfur dioxide (SO₂), sulfuric acid mist (H₂SO₄), greenhouse gases (GHG) and ammonia (NH₃). The BACT determinations contained in this Proposed Plan Approval conform to MassDEP’s regulations and guidance and result in BACT emission limits consistent with those established and published in EPA’s RACT/BACT/LAER Clearinghouse (RBLCL) and other BACT determinations made in Massachusetts and other states including California and New York. MassDEP therefore has determined that the emission limits contained in this Proposed Plan Approval are BACT for this Project.

Please review the entire Proposed Plan Approval, as it stipulates the conditions with which the owner/operator must comply in order for the Project to be operated in compliance with this Proposed Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

The MATEP LP operates the Medical Area Total Energy Plant (MATEP), which is centrally located in the 200 acre Longwood Medical Area (LMA) of Boston. MATEP (the Facility) is a combined heat and power (CHP) plant that supplies steam, chilled water, and electricity to LMA institutions including Boston Children’s Hospital, Brigham and Women’s Hospital, Beth Israel Deaconess Medical Center, Dana-Farber Cancer Institute, Harvard Medical School, Joslin Diabetes Center and other healthcare and research facilities.

MATEP’s energy sources include pipeline natural gas, fuel oil and electric power supplied from the electric power transmission grid. Natural gas is supplied to the plant for combustion at street pressure (5 psig) from NGRID Gas. Fuel oil is stored on-site and used as the sole fuel source for the Facility’s diesel engines as as backup fuel for all other combustion units when the natural gas distribution system cannot efficiently satisfy MATEP’s energy needs. Eversource provides electricity to MATEP via six 13.8 kV utility feeders. MATEP can also export electric power to the grid.

The Facility currently meets customer electrical loads with a combination of electric power purchased through Eversource, and power generated on-site. Power generated by MATEP is delivered by two 12 MW combustion turbine generators (CTG-1 and CTG-2) and its associated heat recovery steam generators, two 11 MW extraction/condensing steam turbine generators (STGs) and six 6.8 MW diesel engine generators (DEGs). High-pressure steam is produced by one 150,000 pound per hour (lb/hr) package boiler (PSG-1), two 180,000 lb/hr package boilers (PSG-2 and PSG-3), two 110,000 lb/hr heat recovery boilers (HRSG-100 and HRSG-200) associated with the CTGs (CTG-1 and CTG-2) and two 180,000 lb/hr HRSGs (Zurn-1 and Zurn-2) associated with the DEGs. The Zurn HRSGs can function as stand-alone boilers when the DEGs are not in operation. The boilers and HRSGs all supply steam to a common header and do not have independent steam cycles.

The Facility currently operates two combustion turbines with HRSGs (CHP units) and is proposing to install and operate a third combustion turbine generator CHP unit, a 14.4 Megawatt (MW) Solar Titan 130 combustion gas turbine (“CTG-3”), that is capable of combusting natural gas as the primary fuel, with ultra low sulfur diesel (ULSD) as a backup fuel. Heat from combustion turbine gases are recovered by passing through a HRSG (“HRSG-300”). A natural gas fired duct burner rated at 38.8 million Btu per hour (mmBtu/hr) will be used at times to supplement steam output from the HRSG; the duct burner will fire natural gas exclusively. The NOx air emissions in the combustion turbine will be reduced through the use of a Dry Low NOx (DLN) combustor to achieve low NOx levels, while combusting gas and liquid fuels. In addition, add-on air pollution controls will be used to further reduce emissions through the use of a selective catalytic reduction (SCR) catalyst for NOx control and an oxidation catalyst for post-combustion control of CO and VOC. The CTG-3/HRSG-300 unit will be housed in the existing Facility.

CTG-3/HRSG-300 will supplement the electric power and steam currently being generated by the two existing CHPs and thereby allow the Facility to reduce its reliance on the existing package boilers, diesel generators, Zurn HRSGs and off-site electric power imports. CTG-3/HRSG-300 will increase the overall energy efficiency of the Facility and decrease the amount of fuel used per unit of energy produced.

The Facility currently operates several heat and power generating emission units identified in Table 1 below.

Table 1. Existing Emission Units at Facility		
EU#	Description of EU	EU Design Capacity
PSG-1	Victory Energy Type O Boiler	214 mmBtu/hr (gas) 205 mmBtu/hr (oil)
PSG-2	Riley Boiler No. 2	244 mmBtu/hr
PSG-3	Riley Boiler No. 3	244 mmBtu/hr
Zurn-1	Zurn Afterburner and HRSG No. 1	225 mmBtu/hr
Zurn-2	Zurn Afterburner and HRSG No. 2	225 mmBtu/hr
DEG-1	Mirrlees Diesel Engine Generator No.1	63.8 mmBtu/hr
DEG-2	Mirrlees Diesel Engine Generator No.2	63.8 mmBtu/hr
DEG-3	Mirrlees Diesel Engine Generator No.3	63.8 mmBtu/hr
DEG-4	Mirrlees Diesel Engine Generator No.4	63.8 mmBtu/hr
DEG-5	Mirrlees Diesel Engine Generator No.5	63.8 mmBtu/hr
DEG-6	Mirrlees Diesel Engine Generator No.6	63.8 mmBtu/hr
CTG-1	Alstom Gas Combustion Turbine No. 1	152.6 mmBtu/hr
CTG-2	Alstom Gas Combustion Turbine No. 2	152.6 mmBtu/hr
HRSG-100	ERI HRSG No. 1 serving CTG-1	75 mmBtu/hr
HRSG-200	ERI HRSG No. 2 serving CTG-2	75 mmBtu/hr
EDG-1	210 KW Emergency Diesel Generator	2.94 mmBtu/hr
EDG-2	410 KW Emergency Diesel Generator	5.47 mmBtu/hr

Table 1 Key:

EU = emission unit
HRSG= heat recovery steam generator
DEG = diesel engine generator
CTG = combustion turbine generator
EDG = emergency diesel generator
PSG = primary steam generator
mmBtu/hr = million Btu per hour

The existing Facility has a common steam header which is capable of receiving steam from the Facility's various combustion units listed in Table 1 above. The steam from this steam header is utilized for the operation of various steam processes including the operation of two steam-driven chillers, low pressure steam for building heating and hospital process steam, and the generation of additional electricity through the two STGs.

In the first stage of the combined cycle mode for CTG-3/HRSG-300, the combustion of natural gas occurs in the combustion turbine with a DLN Combustor. This combustion produces thermal energy in the form of combustion gases that is converted into mechanical energy to drive the gas turbine compressor as well as the generator to produce electrical energy. Hot combustion turbine exhaust gases produce steam within HRSG-300. The high pressure steam produced by HRSG-300 in combination with any supplemental steam provided by other boilers and HRSGs is used to drive the STGs to generate additional electricity. Low pressure steam for customer space heating and other uses is produced by extraction from the STGs and, when necessary, by a pressure reducing station. When operating the STG in extraction mode, it is not necessary to condense the steam leaving the STGs and to reject the associated waste heat to the atmosphere via the plant's cooling towers. Instead, low pressure steam can be extracted from the turbines and provided to customers for heating. After use the customers then return the condensed steam back to the Facility for reuse in the steam cycle.

CTG-3/HRSG-300 will be located within the existing building and will exhaust to the existing stack, a single, double flue stack with an exit height of 315 feet above the ground.

A dedicated extractive CEMS shall be installed within the CTG-3/HRSG-300 ductwork on the facility roof. The CEMS will continuously sample, analyze and record NO_x, CO and NH₃ concentration levels, and the percentage of oxygen (O₂), in the exhaust gas from HRSG-300 exhaust. The CEMS data acquisition system collects, records and processes air emission data and calculates the air emissions from the CTG-3/HRSG-300 into units of pounds per hour. A NO_x process monitor in the turbine exhaust downstream of the selective catalytic reduction (SCR) system will provide data to the NH₃ injection control system to optimize usage of NH₃.

On October 5, 2015, the MATEP LP submitted a draft Quality Assurance and Quality Control Plan to address the CEMS requirements for CTG-3/HRSG-300. This QA/QC Plan describes detailed, complete, step-by-step procedures and operations for activities relating to the CEMS for CTG-3/HRSG-300.

2. EMISSION OFFSETS AND NONATTAINMENT REVIEW

MassDEP evaluated whether the Emission Offsets and Nonattainment Review provisions of 310 CMR 7.00 Appendix A apply to the Project.

310 CMR 7.00: Appendix A: Emission Offsets and Nonattainment Review applies to a new major source or major modification of an existing major source located in a non-attainment area; or a new major source or major modification for NO_x or VOC emissions anywhere in Massachusetts, with applicability determined separately for NO_x and VOC. The facility is not located in a nonattainment area. With respect to NO_x and/or VOC emissions, Appendix A applies for a new major source of 50 or more tons per year or a major modification of an existing major source, that is, a project that causes a net emissions increase of 25 tons per year.

MATEP is an existing major source of NO_x emissions. Proposed permitted emissions from this Project are 7.79 tons per year for NO_x. There are no creditable and contemporaneous increases or decreases in emissions of NO_x at the facility. Therefore, the net emissions increase is also 7.79 tons of NO_x, below the significance threshold of 25 tons per year for NO_x which would trigger a major modification of an existing major source.

MATEP is not an existing major source of VOC emissions. Proposed permitted emissions from this Project are 2.50 tons per year for VOC. For an existing non-major source, the proposed project would need to be major (at 50 tons per year) to trigger Appendix A.

Therefore, the Project is **not** subject to Regulation 310 CMR 7.00 Appendix A.

3. AIR QUALITY IMPACT ANALYSIS

The EPA has developed National Ambient Air Quality Standards (NAAQS) for six air contaminants (criteria pollutants) for the protection of public health and welfare. These criteria pollutants are Nitrogen Dioxide (NO₂), Sulfur Dioxide (SO₂), Particulate Matter (PM), Carbon Monoxide (CO), Ozone (O₃), and Lead (Pb). The NAAQS include both primary and secondary standards of different averaging periods, which protect public health and public welfare, respectively.

MassDEP must determine that emissions from the project will not cause or contribute to ambient air concentrations that exceed the NAAQS. To identify new pollution sources with the potential to significantly alter ambient air quality, the EPA and MassDEP have adopted significant impact levels (SILs) for all the criteria pollutants except O₃ and Pb. The significant impact level (SIL) is an indication of whether a source may cause or contribute to a violation of the NAAQS. Under the PSD program, new major sources (or major modifications of existing major sources) are required to perform an air quality dispersion modeling analysis to predict air quality impacts of the new (or modified) source emissions in comparison to the SILs. If the predicted impact of the new or modified source is less than the SIL for a particular pollutant and averaging period, then

the impact is considered “insignificant” for that pollutant and averaging period and no further modeling is required. However, if the predicted impact of the new or modified source is equal to or greater than the SIL for a particular pollutant and averaging period, then additional impact evaluation is required. This additional evaluation must include measured background levels of pollutants, and emissions from both the new (or modified) source and existing interactive sources (referred to as cumulative dispersion modeling).

MassDEP also requires modeling for non-PSD-regulated pollutant emissions under 310 CMR 7.02 at projects that trigger PSD review

Modeling Approach

Dispersion modeling analyses were performed to assess the Facility’s and the Project’s air impacts of criteria air pollutants and air toxics against applicable SILs, NAAQS, and MassDEP’s Threshold Effects Exposure Limit (TEL) and Allowable Ambient Level (AAL) Guideline values for air toxics. These analyses were conducted in accordance with EPA’s “Guideline on Air Quality Models” (November 2005) and MassDEP’s “Modeling Guidance for Significant Stationary Sources of Air Pollution” (June 2011) and as described in the Air Quality Modeling Protocol submitted to MassDEP on August 26, 2014. The EPA-recommended AERMOD model (current at the time AERMOD version 14134, AERMAP version 11103, AERMET version 14134) was used to perform the dispersion modeling. Dispersion modeling was conducted using emissions and stack parameters from several operating scenarios in an effort to determine the operating scenario that results in the highest predicted impact for each pollutant and averaging period.

Below is the recommendation from MassDEP’s modeling guidance:

For existing facilities, “If maximum predicted impacts of a pollutant due to proposed emission increases from the existing facility are below applicable SILs, the predicted emissions from the modification are considered to be in compliance with the NAAQS for that pollutant. However, a compliance demonstration may be required to ensure that the combined emissions from the existing facility and the modification will not cause or contribute to a NAAQS violation for that pollutant.”

In accordance with this guidance, the Project’s emissions (i.e., the proposed modification) were modeled for comparison to the SILs (results shown in Table 2) and the emissions from the future configuration of the entire facility were modeled for comparison to the NAAQS (results shown in Table 3).

The dispersion modeling was conducted using five years (2009 through 2013) of surface Automated Surface Observing System (ASOS) data collected by the National Weather Service (NWS) from the Logan Airport Station in Boston, Massachusetts. This station is located approximately 5.3 miles to the east-northeast of MATEP. The Logan Airport Station is representative of the Project area since both the Project and the Station are both located in the

city of Boston, and are exposed to the same weather systems and conditions such as urban heat island effects and coastal air-land-sea interactions. Therefore, MATEP LP was not required to collect one year of on-site monitoring before conducting the dispersion modeling. The meteorological data for the five year period from 2009 to 2013 was processed by Epsilon using the latest versions of U.S. EPA AERMINUTE (version 11325), AERSURFACE (version 13016) and AERMET (version 14134). Default processing options were used in the AERMET processing for this analysis. The preferred ASOS 1-minute wind data was used in the processing to reduce the number of calm hours input to the model.

Significant Impact Analysis

To determine the operating scenario that results in the highest impact for each pollutant and averaging period, the modeling analysis includes the operation of the proposed combustion gas turbine and duct burner at eight different operating conditions (two fuels - natural gas and ULSD, two ambient temperatures – 7.4 and 51 °F, and two operating loads – 100% and 50%). Of the eight sets of results for each pollutant and averaging period, the maximum is compared to the respective SIL. Table 2 presents a summary of the SIL analysis results in concentrations of micrograms per cubic meter (ug/m³). For each pollutant and averaging period, it shows the overall maximum predicted Project impact, the SIL, percent of SIL, and operating case. The Project is predicted to have maximum ambient air quality impact concentrations well below SILs for all pollutants and averaging periods.

Table 2					
Criteria Pollutant	Averaging Period	Significant Impact Level (ug/m³)	Maximum Predicted Project Impact¹ (ug/m³)	Percent of SIL (%)	Operating Case (CTG/DB)
NO ₂	Annual	1	0.031	3	ULSD/NG, 51F, 100%
	1-Hour	7.5	0.943	13	ULSD/NG, 51F, 100%
SO ₂	Annual	1	0.006	1	NG/NG, 51F, 100%
	24-Hour	5	0.094	2	NG/NG, 51F, 100%
	3-Hour	25	0.144	1	NG/NG, 51F, 100%
	1-Hour	7.8	0.172	2	NG/NG, 51F, 100%
PM _{2.5}	Annual	0.3	0.060	20	ULSD/NG, 51F, 100%
	24-Hour	1.2	0.829	69	ULSD/NG, 51F, 100%
PM ₁₀	Annual	1	0.072	7	ULSD/NG, 51F, 100%
	24-Hour	5	1.092	22	ULSD/NG, 7.4F, 100%
CO	8-Hour	500	0.838	0.2	ULSD/NG, 7.4F, 100%
	1-Hour	2,000	1.399	0.1	ULSD/NG, 51F, 100%

Table 2 Notes:

1. Maximum predicted Project impacts are the overall highest result in ug/m³ output by AERMOD for each respective averaging time.

Table 2 Key:

SIL = Significant Impact Level
 NO₂ = Nitrogen Dioxide
 SO₂ = Sulfur Dioxide
 PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in diameter
 PM₁₀ = Particulate Matter less than or equal to 10 microns in diameter
 CO = Carbon Monoxide
 NG = Natural Gas
 ULSD = Ultra Low Sulfur Diesel Fuel
 ug/m³ = micrograms per cubic meter
 F = degrees Fahrenheit
 % = percent
 CTG/DB = combustion turbine generator/duct burner

Facility-Wide Modeling Analysis

Modeled impacts from the proposed modification are below SILs for all pollutants and averaging times; therefore, a cumulative analysis including potential nearby interacting sources is not required. However, in accordance with MassDEP modeling guidance, modeling of the entire facility in its future configuration was performed for comparison to the NAAQS. The same operating cases as shown in Table 2 for each pollutant and averaging period are carried forward for the facility-wide modeling. Table 3 presents a summary of the NAAQS analysis results in concentrations of micrograms per cubic meter (ug/m³). For each pollutant and averaging period, it shows the maximum predicted Facility impact in the form of the standard, the background concentration, the total impact (modeled impact plus background), the primary and secondary NAAQS, and percent of primary NAAQS. The future configuration of the Facility is predicted to have maximum ambient air quality impact concentrations below the NAAQS for all pollutants and averaging periods.

Table 3							
Criteria Pollutant	Averaging Period	Primary NAAQS (ug/m³)	Secondary NAAQS (ug/m³)	Maximum Predicted Facility Impact (ug/m³)	Background Conc. (ug/m³)	Total Impact (ug/m³)	Percent NAAQS (%)
NO ₂	Annual ¹	100	Same	2.8	38.3	41.1	41
	1-Hour ²	188	None	85.00	76.7	161.6	86
SO ₂	Annual ^(1,3)	80	None	0.75	6.2	6.9	9
	24-Hour ^(3,4)	365	None	10.24	24.6	34.9	10
	3-Hour ³	None	1,300	23.94	64.5	88.4	7
	1-Hour ^(5,6)	196	None	24.24	55.3	79.5	41
PM _{2.5}	Annual ⁷	12	Same	0.13	9.2	9.3	78
	24-Hour ⁸	35	Same	2.05	21.7	23.8	68

Table 3							
Criteria Pollutant	Averaging Period	Primary NAAQS (ug/m³)	Secondary NAAQS (ug/m³)	Maximum Predicted Facility Impact (ug/m³)	Background Conc. (ug/m³)	Total Impact (ug/m³)	Percent NAAQS (%)
PM ₁₀	Annual 24-Hour ⁹	50	Same	2.21	16.8	19.0	38
		150	Same	7.81	38.0	45.8	31
CO	8-Hour ³	10,000	None	9.65	1368.0	1377.6	14
	1-Hour ³	40,000	None	13.99	2052.0	2066.0	5
O ₃	8-Hour ¹⁰	147	Same	NA	NA	NA	NA
Pb	3-Month ¹	0.15	Same	0.00042	0.017	0.017	12

Table 3 Notes:

1. Not to be exceeded.
2. Compliance based on 3 year average of the 98th percentile of the daily maximum 1 hour average at each modeled receptor. The 1 hour NO₂ standard was effective April 12, 2010.
3. EPA has indicated that the 24 hour and annual average primary standards for SO₂ will be revoked.
4. Not to be exceeded more than once per year.
5. Compliance based on 3 year average of 99th percentile of the daily maximum 1 hour average at each modeled receptor.
6. The 1 hour SO₂ standard was effective as of August 23, 2010.
7. Compliance based on 3 year average of weighted annual mean PM_{2.5} concentrations at each modeled receptor.
8. Compliance based on 3 year average of 98th percentile of 24 hour concentrations at each modeled receptor.
9. Not to be exceeded more than once per year on average over 3 years.
10. Compliance based on 3 year average of fourth highest daily maximum 8 hour average ozone concentrations measured at each monitor within an area.

Table 3 Key:

NAAQS = National Ambient Air Quality Standards
 EPA = United States Environmental Protection Agency
 NO₂ = Nitrogen Dioxide
 SO₂ = Sulfur Dioxide
 PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in diameter
 PM₁₀ = Particulate Matter less than or equal to 10 microns in diameter
 CO = Carbon Monoxide
 O₃ = Ozone
 Pb = Lead
 ug/m³ = micrograms per cubic meter
 NA = Not Applicable
 < = less than
 % = percent

Air Toxics Analysis

MassDEP has established health based ambient air guidelines for a variety of chemicals (air toxics). These air guidelines establish two limits for each chemical listed: an Allowable Ambient Limit (AAL), which is based on an annual average concentration; and a Threshold Effects Exposure Limit (TEL), which is based on a 24-hour time period. In general, AALs are lower than TELs, and represent the concentration associated with a one in one million excess lifetime cancer risk, assuming a lifetime of continuous exposure to that concentration. For chemicals that do not pose cancer risks, the AAL is equal to the TEL.

Table 4 presents the projected maximum impacts for each air toxic that will potentially be emitted by the Project at the Facility for which an AAL or TEL has been established. Predicted impacts are based on the worst case emission scenarios input to AERMOD. As shown in Table 4, the Project's maximum predicted ambient air quality impact concentrations were significantly below applicable AALs and TELs for all of the air toxics modeled.

Table 4¹			
Pollutant	Averaging Period	AAL/TEL (ug/m³)	Maximum Predicted Project Impact (ug/m³)
Acetaldehyde	24-Hour (TEL)	30	1.24E-03
	Annual (AAL)	0.4	8.96E-05
Acrolein	24-Hour (TEL)	0.07	1.98E-04
	Annual (AAL)	0.07	1.43E-05
Ammonia	24-Hour (TEL)	100	3.01E-01
	Annual (AAL)	100	2.18E-02
Benzene	24-Hour (TEL)	0.6	1.66E-03
	Annual (AAL)	0.1	7.99E-05
1,3-Butadiene	24-Hour (TEL)	1.20	4.79E-04
	Annual (AAL)	0.002	2.02E-05
o-Dichlorobenzene	24-Hour (TEL)	81.74	8.60E-06
	Annual (AAL)	81.74	6.22E-07
Ethylbenzene	24-Hour (TEL)	300	9.92E-04
	Annual (AAL)	300	7.17E-05
Formaldehyde	24-Hour (TEL)	2	2.26E-02
	Annual (AAL)	0.08	1.61E-03
Hexane	24-Hour (TEL)	95.24	1.29E-02
	Annual (AAL)	47.62	9.32E-04
Naphthalene	24-Hour (TEL)	14.25	1.05E-03
	Annual (AAL)	14.25	4.46E-05

Table 4¹			
Pollutant	Averaging Period	AAL/TEL (ug/m³)	Maximum Predicted Project Impact (ug/m³)
Propylene Oxide	24-Hour (TEL)	6	8.99E-04
	Annual (AAL)	0.3	6.50E-05
Toluene	24-Hour (TEL)	80	4.06E-03
	Annual (AAL)	20	2.92E-04
Xylenes	24-Hour (TEL)	11.80	1.98E-03
	Annual (AAL)	11.80	1.43E-04
Total PAH	24-Hour (TEL)	0.003	1.20E-03
	Annual (AAL)	0.003	5.15E-05
Total POM	24-Hour (TEL)	1.00E-03	6.32E-07
	Annual (AAL)	4.00E-04	4.57E-08
Antimony	24-Hour (TEL)	0.02	0.00E+00
	Annual (AAL)	0.0002	0.00E+00
Arsenic	24-Hour (TEL)	0.003	5.96E-05
	Annual (AAL)	0.0003	2.44 E-06
Beryllium	24-Hour (TEL)	0.001	9.36E-06
	Annual (AAL)	0.0004	3.85E-07
Cadmium	24-Hour (TEL)	0.003	8.40E-05
	Annual (AAL)	0.001	3.38E-06
Chromium (total)	24-Hour (TEL)	1.36	3.39E-04
	Annual (AAL)	0.68	1.39E-05
Chromium (hexavalent)	24-Hour (TEL)	0.003	0.00E+00
	Annual (AAL)	0.0001	0.00E+00
Cobalt	24-Hour (TEL)	0.27	6.02E-07
	Annual (AAL)	0.18	4.35E-08
Copper	24-Hour (TEL)	0.54	0.00E+00
	Annual (AAL)	0.54	0.00E+00
Fluoride	24-Hour (TEL)	6.8	0.00E+00
	Annual (AAL)	6.8	0.00E+00
Lead	24-Hour (TEL)	0.14	4.19E-04
	Annual (AAL)	0.07	1.73E-05
Mercury (elemental)	24-Hour (TEL)	0.14	3.78E-05
	Annual (AAL)	0.07	1.54E-06
Nickel	24-Hour (TEL)	0.27	1.53E-04
	Annual (AAL)	0.18	6.14E-06
Selenium	24-Hour (TEL)	0.54	7.48E-04
	Annual (AAL)	0.54	3.09E-05

Table 4¹			
Pollutant	Averaging Period	AAL/TEL (ug/m³)	Maximum Predicted Project Impact (ug/m³)
1,1,1-Trichloroethane	24-Hour (TEL)	1038.37	0.00E+00
	Annual (AAL)	1038.37	0.00E+00
Vanadium	24-Hour (TEL)	0.27	0.00E+00
	Annual (AAL)	0.27	0.00E+00

Table 4 Notes:

1. Air toxics do not have a NAAQS, with the exception of lead. Modeled values for lead are well below the NAAQS standard of 0.15 ug/m³.

Table 4 Key:

AAL = Allowable Ambient Limit
 TEL = Threshold Effects Exposure Limit
 ug/m³ = micrograms per cubic meter
 E- = exponential to the negative power
 E+ = exponential to the positive power

4. ENVIRONMENTAL JUSTICE (EJ)

Title VI of the federal Civil Rights Act of 1964 applies to all recipients of federal financial assistance. The Executive Office of Energy and Environmental Affairs (EOEEA) is a recipient of federal financial assistance for the administration of the Department’s air pollution control program. Section 601 of Title VI provides that:

No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance.

On October 2, 2002, EOEEA adopted an Environmental Justice Policy (EJ Policy) that requires the Department to make environmental justice an integral consideration in the implementation and enforcement of laws, regulations, and policies as a way to comply with Title VI of the federal Civil Rights Act of 1964.

EOEEA, in the June 26, 2015 MEPA Certificate for the MATEP LP project, concluded that the project exceeds an Expanded Environmental Notification Form (EENF) threshold for air and is located within five miles of an Environmental Justice (EJ) population. Therefore, the project is subject to EJ Policy requirements for enhanced public participation. MATEP LP conducted an enhanced analysis of impacts and mitigation. The project’s ambient air impacts, combined with the pre-existing background levels, will meet the federal NAAQS that are designed to protect

public's health against health effects of air pollutants with a margin of safety and will therefore have no significant adverse health impacts upon any Environmental Justice population.

Enhanced public participation shall include publishing the public hearing notice on this Proposed Plan Approval in the Boston Herald, Mission Hill Gazette, El Mundo Boston, O Jornal, Sampan, and Boston Russian Bulletin; in multiple languages including English, Chinese, Russian, Portuguese, and Spanish, also posting the public hearing notice on the MassDEP web site <http://www.mass.gov/eea/agencies/massdep/about/contacts/matep.html>, The Proposed Plan Approval, Draft PSD Permit and Draft PSD Fact Sheet are also available for review at the Boston Public Health Commission, located at 1010 Massachusetts Ave, 6th Floor, Boston, MA and the Parker Hill Branch of the Boston Public Library, located at 1497 Tremont Street, Boston, MA.

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5. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 5 is subject to and regulated by this Plan Approval:

Table 5			
EU#	Description	Design Capacity	Pollution Control Device (PCD)
CTG-3/ HRSG-300	Solar Titan 130 Combustion Turbine/Heat Recovery Steam Generator Including Duct Burner (DB)	164.6 mmBtu/hr, HHV (energy input) for CTG, Natural Gas Firing 158.8 mmBtu/hr, HHV (energy input) for CTG, ULSD Firing 14.4 MW nominal (electric power output) for CTG-3 38.8 mmBtu/hr HHV (energy input) for DB, Natural Gas Firing	Dry Low NOx Combustor (PCD1) Selective Catalytic Reduction (PCD2) Oxidation Catalyst (PCD3)

Table 5 Key:

EU# = Emission Unit Number
 mmBtu/hr = fuel heat input, million British thermal units per hour
 HHV = higher heating value basis
 MW = generator net electrical output, Megawatts
 NOx = Oxides of Nitrogen
 ULSD = ultra low sulfur diesel
 CTG = combustion turbine generator
 HRSG = heat recovery steam generator
 DB = duct burner

6. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Project is subject to, and the Permittee shall ensure that the Project shall not exceed the Operational, Production, and Emission Limits as contained in Table 6 below, including notes:

Table 6			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
CTG-3/ HRSG-300	Operation at \geq MECL, ^(2,4) excluding start-ups and shutdowns ³	NOx (no duct firing)	≤ 1.21 lb/hr ¹ ≤ 0.0074 lb/mmBtu ¹ ≤ 2.0 ppmvd@15%O ₂ ¹
	Natural Gas Heat Input Rate of CTG-3: ≤ 164.6 mmBtu per hour, HHV Natural Gas Firing Heat Input Rate of DB: ≤ 38.8 mmBtu per hour Natural Gas Firing	NOx (with duct firing)	≤ 1.51 lb/hr ¹ ≤ 0.0074 lb/mmBtu ¹ ≤ 2.0 ppmvd@15%O ₂ ¹
		CO (no duct firing)	≤ 0.74 lb/hr ¹ ≤ 0.0045 lb/mmBtu ¹ ≤ 2.0 ppmvd@15%O ₂ ¹
		CO (duct firing)	≤ 0.92 lb/hr ¹ ≤ 0.0045 lb/mmBtu ¹ ≤ 2.0 ppmvd @15%O ₂ ¹
		VOC (no duct firing), as Methane (CH ₄)	≤ 0.36 lb/hr ¹ ≤ 0.0022 lb/mmBtu ¹ ≤ 1.70 ppmvd@15%O ₂ ¹
		VOC (with duct firing), as Methane (CH ₄)	≤ 0.45 lb/hr ¹ ≤ 0.0022 lb/mmBtu ¹ ≤ 1.70 ppmvd@15%O ₂ ¹
		S in Fuel	≤ 1.0 grains/100 scf ¹
		SO ₂ (no duct firing)	≤ 0.48 lb/hr ¹ ≤ 0.0029 lb/mmBtu ¹ ≤ 0.6 ppmvd@15%O ₂ ¹
		SO ₂ (duct firing)	≤ 0.58 lb/hr ¹ ≤ 0.0029 lb/mmBtu ¹ ≤ 0.6 ppmvd@15%O ₂ ¹
		H ₂ SO ₄ (no duct firing)	≤ 0.47 lb/hr ¹ ≤ 0.0029 lb/mmBtu ¹ ≤ 0.4 ppmvd@15%O ₂ ¹
		H ₂ SO ₄ (duct firing)	≤ 0.58 lb/hr ¹ ≤ 0.0029 lb/mmBtu ¹ ≤ 0.4 ppmvd@15%O ₂ ¹

Table 6			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
CTG-3/ HRSG-300		PM/PM ₁₀ /PM _{2.5} (no duct firing) ⁵	≤ 3.29 lb/hr ¹ ≤ 0.020 lb/mmBtu ¹
		PM/PM ₁₀ /PM _{2.5} (duct firing) ⁵	≤ 4.07 lb/hr ¹ ≤ 0.020 lb/mmBtu ¹
	Operation at ≥ MECL, ^(2,4) excluding start-ups and shutdowns ³	NH ₃ (no duct firing)	≤ 0.44 lb/hr ¹ ≤ 0.0027 lb/mmBtu ¹ ≤ 2.0 ppmvd@15% O ₂ ¹
	Natural Gas Heat Input Rate of CTG-3: ≤ 164.6 mmBtu per hour, HHV Natural Gas Firing	NH ₃ (duct firing)	≤ 0.55 lb/hr ¹ ≤ 0.0027 lb/mmBtu ¹ ≤ 2.0 ppmvd@15% O ₂ ¹
	Heat Input Rate of DB: ≤ 38.8 mmBtu per hour Natural Gas Firing	Greenhouse Gases (GHG), as CO _{2e} (no duct firing)	≤ 19584 lb/hr ¹ ≤ 118.9 lb CO ₂ /mmBtu ¹ ≤ 119.0 lb CO _{2e} /mmBtu ¹
		Greenhouse Gases (GHG), as CO _{2e} (with duct firing)	≤ 24,200 lb/hr ¹ ≤ 118.9 lb CO ₂ /mmBtu ¹ ≤ 119.0 lb CO _{2e} /mmBtu ¹
	Operation at ≥ MECL ^(2,4) , excluding start-ups and shutdowns ³	NOx (no duct firing)	≤ 3.70 lb/hr ¹ ≤ 0.0233 lb/mmBtu ¹ ≤ 6.0 ppmvd@15% O ₂ ¹
	ULSD Heat Input Rate of CTG-3: ≤ 158.8 mmBtu per hour, HHV ULSD Firing	NOx (with duct firing)	≤ 4.56 lb/hr ¹ ≤ 0.0231 lb/mmBtu ¹ ≤ 6.0 ppmvd @15% O ₂ ¹
	Heat Input Rate of duct burner: ≤ 38.8 mmBtu per hour Natural Gas Firing	CO (no duct firing)	≤ 2.63 lb/hr ¹ ≤ 0.0166 lb/mmBtu ¹ ≤ 7.0 ppmvd@15% O ₂ ¹
	Maximum annual fuel usage for ULSD is 878,400 gallons per 12-month rolling period, which is based on 720 operating hours and a maximum firing rate of 1,220 gallons per hour (See Special Terms and Conditions)	CO (duct firing)	≤ 3.24 lb/hr ¹ ≤ 0.0164 lb/mmBtu ¹ ≤ 7.0 ppmvd@15% O ₂ ¹
		VOC (no duct firing), as Methane (CH ₄)	≤ 1.51 lb/hr ¹ ≤ 0.0095 lb/mmBtu ¹ ≤ 7.0 ppmvd@15% O ₂ ¹

Table 6			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
CTG-3/ HRS-300		VOC (with duct firing), as Methane (CH ₄)	$\leq 1.86 \text{ lb/hr}^1$ $\leq 0.0094 \text{ lb/mmBtu}^1$ $\leq 7.0 \text{ ppmvd}@15\% \text{O}_2^1$
	<p>Operation at \geq MECL^(2,4), excluding start-ups and shutdowns³</p> <p>ULSD Heat Input Rate of CTG-3: $\leq 158.8 \text{ mmBtu per hour, HHV}$ ULSD Firing</p> <p>Heat Input Rate of duct burner: $\leq 38.8 \text{ mmBtu per hour}$ Natural Gas Firing</p> <p>Maximum annual fuel usage for ULSD is 878,400 gallons per 12-month rolling period, which is based on 720 operating hours and a maximum firing rate of 1,220 gallons per hour (See Special Terms and Conditions)</p>	SO ₂ (no duct firing)	$\leq 0.25 \text{ lb/hr}^1$ $\leq 0.0016 \text{ lb/mmBtu}^1$ $\leq 0.3 \text{ ppmvd}@15\% \text{O}_2^1$
		SO ₂ (duct firing)	$\leq 0.36 \text{ lb/hr}^1$ $\leq 0.0016 \text{ lb/mmBtu}^1$ $0.3 \text{ ppmvd}@15\% \text{O}_2^1$
		H ₂ SO ₄ (no duct firing)	$\leq 0.25 \text{ lb/hr}^1$ $\leq 0.0016 \text{ lb/mmBtu}^1$ $\leq 0.2 \text{ ppmvd}@15\% \text{O}_2^1$
		H ₂ SO ₄ (duct firing)	$\leq 0.36 \text{ lb/hr}^1$ $\leq 0.0018 \text{ lb/mmBtu}^1$ $\leq 0.22 \text{ ppmvd}@15\% \text{O}_2^1$
		PM/PM ₁₀ /PM _{2.5} (no duct firing) ⁵	$\leq 5.40 \text{ lb/hr}^1$ $\leq 0.034 \text{ lb/mmBtu}^1$
		PM/PM ₁₀ /PM _{2.5} (duct firing) ⁵	$\leq 6.15 \text{ lb/hr}^1$ $\leq 0.031 \text{ lb/mmBtu}^1$
		NH ₃ (no duct firing)	$\leq 0.46 \text{ lb/hr}^1$ $\leq 0.0029 \text{ lb/mmBtu}^1$ $\leq 2.0 \text{ ppmvd}@15\% \text{O}_2^1$
		NH ₃ (duct firing)	$\leq 0.57 \text{ lb/hr}^1$ $\leq 0.0029 \text{ lb/mmBtu}^1$ $\leq 2.0 \text{ ppmvd}@15\% \text{O}_2^1$
		Greenhouse Gases (GHG), as CO _{2e} (no duct firing)	$\leq 26,363 \text{ lb/hr}^1$ $\leq 165.9 \text{ lb CO}_2/\text{mmBtu}^1$ $\leq 166.0 \text{ lb CO}_2e/\text{mmBtu}^1$
		Greenhouse Gases (GHG), as CO _{2e} (with duct firing)	$\leq 31,000 \text{ lb/hr}^1$ $\leq 165.9 \text{ lb CO}_2/\text{mmBtu}^1$ $\leq 166.0 \text{ lb CO}_2e/\text{mmBtu}^1$

Table 6			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
CTG-3/ HRSG-300	<p style="text-align: center;">Operation during start-ups ^(3,6) Natural Gas Firing (CTG-3) Start-up duration: ≤ 3.0 hours</p>	NO _x	≤ 36.2 lb per event
		CO	≤ 153.7 lb per event
		PM/PM ₁₀ /PM _{2.5} ⁵	≤ 12.2 lb per event ⁷
		H ₂ SO ₄	≤ 1.8 lb per event ⁷
		SO ₂	≤ 1.8 lb per event ⁷
		VOC	≤ 11.4 lb per event
	<p style="text-align: center;">Operation during shutdowns ^(3,6) Natural Gas Firing (CTG-3) Shutdown duration: ≤ 1.0 hour</p>	NO _x	≤ 11.2 lb per event
		CO	≤ 41.6 lb per event
		PM/PM ₁₀ /PM _{2.5} ⁵	≤ 4.1 lb per event ⁷
		H ₂ SO ₄	≤ 0.6 lb per event ⁷
		SO ₂	≤ 0.6 lb per event ⁷
		VOC	≤ 3.3 lb per event
	<p style="text-align: center;">Operation during start-ups ^(3,6) ULSD Firing (CTG-3) Start-up duration: ≤ 3.0 hours</p>	NO _x	≤ 112.6 lb per event
		CO	≤ 144.8 lb per event
		PM/PM ₁₀ /PM _{2.5} ⁵	≤ 18.5 lb per event ⁷
		H ₂ SO ₄	≤ 1.2 lb per event ⁷
		SO ₂	≤ 1.2 lb per event ⁷
		VOC	≤ 85.4 lb per event
	<p style="text-align: center;">Operation during shutdowns ^(3,6) ULSD Firing (CTG-3) Shutdown duration: ≤ 1.0 hour</p>	NO _x	≤ 34.2 lb per event
		CO	≤ 40.9 lb per event
		PM/PM ₁₀ /PM _{2.5} ⁵	≤ 6.2 lb per event ⁷
		H ₂ SO ₄	≤ 0.4 lb per event ⁷
		SO ₂	≤ 0.4 lb per event ⁷
		VOC	≤ 33.4 lb per event

Table 6			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
CTG-3/ HRSG-300	Operation all load conditions including start-ups and shutdowns Fuel Heat Input of CTG-3/ HRSG-300 ≤ 1,781,784 mmBtu, HHV per 12- month rolling period ⁸	NO _x	≤ 7.79 TPY ⁹
		CO	≤ 5.84 TPY ⁹
		VOC	≤ 2.50 TPY ⁹
		NH ₃	≤ 2.43 TPY ⁹
		H ₂ SO ₄	≤ 2.55 TPY ⁹
		Pb	≤ 0.1 TPY ⁹
		Formaldehyde or Single HAP	≤ 0.52 TPY ⁹
		Total HAPS	≤ 0.81 TPY ⁹
		PM/PM ₁₀ /PM _{2.5} ⁵	≤ 18.8 TPY ⁹
		SO ₂	≤ 2.56 TPY ⁹
		CO ₂	≤ 108,200 TPY ⁹
		Greenhouse Gases (GHG), as CO _{2e}	≤ 108,500 TPY ⁹

Table 6 Notes:

1. BACT emission limits are one hour block averages. Emission limits are based on CTG-3/HRSG-300 operating at 7.4 degrees Fahrenheit ambient temperature with and without natural gas duct firing (38.8 mmBtu/hr) at a combustion turbine maximum firing rate of either 164.6 mmBtu/hr, HHV for natural gas or 158.8 mmBtu/hr, HHV for ULSD. These constitute worst case steady-state emissions.
2. The Minimum Emissions Compliance Load (MECL) is defined as the lowest operational load achievable to maintain compliance with the emission limitations following start-up, pending the completion of an MECL optimization study.
3. Start-ups shall last no longer than 3 hours beginning from the time of flame-on in the combustor (after a period of downtime) until compliance with the steady-state NO_x emission limit is achieved. Shutdowns shall last no longer than 1 hour and include the time from when ammonia injection ceases until flame-out.
4. With the exception of CO_{2e}, lead and HAPs compliance with limits will be based on an initial compliance test at four (4) load conditions with and without duct firing that cover the entire normal operating range: the minimum emissions compliance load (MECL); 75 percent load; 85 percent load; and 100 percent load. Compliance demonstration shall be made by emissions compliance testing within 180 days after initial firing of unit. CO_{2e} will be calculated using the methodology outlined in 40 CFR Part 98.
5. Emission limit is for the sum of filterable and condensable particulate via EPA Reference Methods 201A and 202 or an equivalent test method(s) approved by MassDEP.
6. Start-up and shutdown emission limits and durations are subject to revision by MassDEP based on review of compliance data and CEMs data generated from the first year of commercial operation.
7. The startup and shutdown PM, SO₂ and H₂SO₄ emissions are not elevated during these transient conditions; PM SO₂ and H₂SO₄ emission rates are consistent across all normal operating loads.
8. The total allowable fuel heat input of CTG-3/HRSG-300 during the 12-month rolling period is based on the heat input rates for CTG-3 of 164.6 mmBtu/hr and HRSG-300 of 38.8 mmBtu/hr, based on a usage of 8760 hours per year while combusting natural gas.

9. Twelve-month rolling emission limits include start-up and shut-down emissions and are based on either: a CTG-3 natural gas usage of 8040 hours per year at 164.6 mmBtu/hr and ULSD usage of 720 hours per year at 158.8 mmBtu/hr with 8760 hours per year of duct burner operation on natural gas only at a maximum heat input of 38.8 mmBtu/hr; or a CTG-3 natural gas usage of 8760 hours per year at 164.6 mmBtu/hr with 8760 hours per year of duct burner operation on natural gas only at a maximum heat input of 38.8 mmBtu/hr; whichever firing condition results in the worst case emissions rate for the specific pollutant.

Table 6 Key:

EU# = Emission Unit Number

No. = Number

NO_x = Nitrogen Oxides

CO = Carbon Monoxide

VOC = Volatile Organic Compounds, excludes methane and ethane.

S = Sulfur

SO₂ = Sulfur Dioxide

PM = Total Particulate Matter

PM₁₀ = Particulate Matter with particle diameter less than or equal to 10 microns

PM_{2.5} = Particulate Matter with particle diameter less than or equal to 2.5 microns

NH₃ = Ammonia

HAPS = Hazardous Air Pollutants

CO₂ = Carbon Dioxide

CO_{2e} = Greenhouse Gases expressed as Carbon Dioxide equivalent and calculated by multiplying each of the six greenhouse gases (Carbon Dioxide, Nitrous Oxide, Methane, Hydrofluorocarbons, Perfluorocarbons, Sulfur Hexafluoride) mass amount of emissions, in tons per year, by the gas's associated global warming potential published at Table A-1 of 40 CFR Part 98, Subpart A and summing the six resultant values.

lb = pounds

lb/hr = pounds per hour

grains/scf = grains per standard cubic foot

mmBtu = million British thermal units, higher heating value (HHV) basis

lb/mmBtu = pounds per million British thermal units

ppmvd = parts per million by volume, dry basis, corrected to 15 percent oxygen

scf = standard cubic feet

% = percent

TPY = tons per 12-month rolling period

°F = degrees Fahrenheit

psia = pounds per square inch, absolute

EPA = United States Environmental Protection Agency

CFR = Code of Federal Regulations

CTG/HRSG = combustion turbine generator/heat recovery steam generator

ULSD = Ultra Low Sulfur Diesel Fuel Oil containing a maximum of 0.0015 weight percent sulfur

CEMS = Continuous Emission Monitoring Systems

HHV = higher heating value basis

MECL = minimum emissions compliance load

< = less than

> = greater than

≤ = less than or equal to

≥ = greater than or equal to

NA = Not Applicable

B. NEW SOURCE PERFORMANCE STANDARDS (NSPS)

Stationary Combustion Turbine/Heat Recovery Steam Generator/Duct Burner

The NSPS, 40 CFR Part 60 Subpart KKKK, apply to stationary combustion turbines with a heat input rating greater than or equal to 10 mmBtu/hr, and which commenced construction, reconstruction, or modification after February 18, 2005 as well as any associated HRSGs or duct burners.

The NSPS allow the turbine owner or operator the choice of either a concentration based or output based NO_x emission standard. The concentration based limit is expressed in units of ppmvd @ 15% O₂. The applicable NO_x emission standard for CTG-3/HRSG-300 and DB is 25 ppmvd and 74 ppmvd @ 15% O₂, while combusting natural gas and ULSD, respectively. The Permittee has ensured that the Project will comply with these limits through the use of dry low-NO_x combustion technology in conjunction with SCR add-on NO_x control technology to control NO_x emissions to 2.0 ppmvd @ 15% O₂ during natural gas firing and 6.0 ppmvd @ 15% O₂ during ULSD firing, well below the NSPS limits.

The NSPS for SO₂ emissions are the same for all turbines regardless of size or fuel type. The NSPS for turbines located in the continental area prohibits the discharge into the atmosphere of any gases that contain SO₂ in excess of 110 ng/J (nanograms per Joule) gross energy output. The owner or operator of the turbine can choose to comply with either the SO₂ limit or the limit on the sulfur content of the fuel burned. For a turbine located in a continental area, the fuel sulfur content limit is 26 ng/J (0.060 lb SO₂/mmBtu) heat input. The Permittee will meet the NSPS for SO₂ when combusting natural gas with sulfur dioxide emission rate of 0.0029 lb,SO₂/mmBtu and 0.0016 lb SO₂/mmBtu when combusting ULSD, which are both well below the NSPS limit.

The Permittee shall comply with all applicable emission standards, monitoring, record keeping, and reporting requirements of 40 CFR Part 60 Subpart KKKK for CTG-3/HRSG-300 and DB.

C. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) for the following Source Categories

Stationary Combustion Turbine/Heat Recovery Steam Generator /Duct Burner

The NESHAP, at 40 CFR Part 63 Subpart YYYY apply to combustion turbines at major sources of hazardous air pollutant (HAP) emissions. A major source of HAP emissions is a source which has the potential to emit ten (10) or more tons per year of any single HAP, or twenty five (25) or more tons per year of all HAPs combined. The Facility is not a major source of HAP emissions. Therefore, the Project's combustion turbine is not subject to the 40 CFR Part 63 Subpart YYYY requirements.

D. EMISSIONS TRADING PROGRAM

The Facility is not subject to any of the emissions allowance trading program such as the Massachusetts CO2 Budget Trading Program - 310 CMR 7.70.

E. COMPLIANCE DEMONSTRATION

The Project is subject to, and the Permittee shall ensure that the Project shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 7, 8, and 9 below:

Table 7	
EU#	Monitoring and Testing Requirements
CTG-3/ HRSG-300	<p>1. The Permittee shall ensure that the Project is constructed to accommodate the emissions (compliance) testing requirements as stipulated in 40 CFR Part 60 Appendix A. The two outlet sampling ports (90 degrees apart from each other) for each emission unit must be located at a minimum of one half duct diameter upstream and two duct diameters downstream of any flow disturbance. In addition, the Permittee shall facilitate access to the sampling ports and testing equipment by constructing platforms, ladders, or other necessary equipment.</p> <p>2. The Permittee shall ensure that compliance testing of the Project is completed within 180 days after initial firing of CTG-3/HRSG-300 to demonstrate compliance with the emission limits specified in Table 6 of this Plan Approval. All emissions testing shall be conducted in accordance with MassDEP’s “Guidelines for Source Emissions Testing” and in accordance with EPA reference test methods as specified in 40 CFR Part 60, Appendix A and 40 CFR Part 51, Appendix M, or by another method which has been approved in writing by MassDEP. Permittee shall schedule the compliance testing such that MassDEP personnel can witness it.</p> <p>3. The Permittee shall conduct initial compliance tests of the Project to document actual emissions of CTG-3/HRSG-300 so as to determine its compliance status versus the emission limits (in lb/hr, lb/mmBtu, and ppmvd) in Table 6 for the pollutants listed below.</p> <ul style="list-style-type: none"> • NOx • CO • VOC • SO₂ • PM₁₀ • PM_{2.5} • NH₃ • H₂SO₄ • CO₂ <p>Testing for these pollutants for CTG-3/HRSG-300 shall be conducted at four (4) load conditions with and without duct firing that cover the entire normal operating range: the minimum emissions compliance load (MECL); 75 percent load; 85 percent load; and 100 percent load.</p>

Table 7	
EU#	Monitoring and Testing Requirements
CTG-3/ HRSG-300	<p>4. The Permittee shall install, calibrate, test, and operate a Data Acquisition and Handling System(s) (DAHS) and CEMS, serving CTG-3/HRSG-300 to measure and record the following emissions:</p> <ul style="list-style-type: none"> • O₂ • NO_x • CO • NH₃ <p>The system shall include diluents gas (O₂) and fuel flow meters.</p>
	<p>5. The Permittee shall ensure that all emission monitors and recorders serving CTG-3/HRSG-300 comply with MassDEP approved performance and location specifications, and conform with the EPA monitoring specifications at 40 CFR 60.13 and 40 CFR Part 60 Appendices B and F.</p>
	<p>6. The Permittee shall ensure that the subject CEMS are equipped with properly operated and properly maintained audible and visible alarms to activate whenever emissions from the Project exceed the short term limits established in Table 6 of this Plan Approval.</p>
	<p>7. The Permittee shall operate each CEMS serving CTG-3/HRSG-300 at all times except for periods of CEMS calibration checks, zero and span adjustments, preventative maintenance, and periods of unavoidable malfunction.</p>
	<p>8. The Permittee shall obtain and record emissions data from each CEMS serving CTG-3/HRSG-300 for at least seventy (75) percent of each emission unit's operating hours per day, for at least seventy five (75) percent of each emission unit's operating hours per month, and for at least ninety five (95) percent of each emission unit's operating hours per quarter, except for periods of CEMS calibration checks, zero and span adjustments, and preventive maintenance.</p>
	<p>9. All periods of excess emissions occurring from the Project, even if attributable to an emergency/malfunction, start-up/shutdown or equipment cleaning, shall be quantified and included by the Permittee in the compilation of emissions and determination of compliance with the emission limits as stated in Table 6 of this Plan Approval. ("Excess Emissions" are defined as emissions which are in excess of the emission limits as stated in Table 6). An exceedance of emission limits in Table 6 due to an emergency or malfunction shall not be deemed a federally permitted release as that term is used in 42 U.S.C. Section 9601(10)</p>
	<p>10. The Permittee shall use and maintain its CEMS serving CTG-3/HRSG-300 as "direct-compliance" monitors to measure NO_x, CO, NH₃, and O₂. "Direct-compliance" monitors generate data that legally documents the compliance status of a source.</p>

Table 7	
EU#	Monitoring and Testing Requirements
CTG-3/ HRSG-300	11. The Permittee shall install, operate, and maintain a fuel metering device and recorder for CTG-3 that records natural gas consumption in standard cubic feet (scf).
	12. The Permittee shall install, operate, and maintain a fuel metering device and recorder for duct burner HRSG-300 that records natural gas consumption in standard cubic feet (scf).
	13. The Permittee shall install, operate, and maintain a fuel metering device and recorder for CTG-3 that records ULSD consumption in gallons.
	14. Permittee shall monitor the quantity and sulfur content of ULSD fuel oil burned in CTG-3.
	15. The Permittee shall monitor fuel heat input rate (mmBtu/hr, HHV) and total fuel heat input (mmBtu) for CTG-3/HRSG-300.
	16. The Permittee shall monitor each date and daily hours of operation and total hours of operation for CTG-3/HRSG-300 per month and twelve month rolling period.
	17. The Permittee shall ensure that initial compliance tests of the Project are conducted for startup and shutdown periods as defined in the Permittee’s Application for CTG-3/HRSG-300. Emission data generated from this testing shall be made available for review by MassDEP.
	18. Whenever CTG-3 is operating during start-ups and shutdowns, the VOC emissions shall be considered as occurring at the rate determined in the most recent compliance test for start-up/shutdown conditions.
	19. If CTG-3 is operating at the MECL or greater, and if its CO emissions are below the CO emission limit at the given combustion turbine operating conditions, its VOC emissions shall be considered as meeting the emission limits contained in this Plan Approval, subject to correlation as contained in Condition 20 below.
	20. If CTG-3 is operating at the MECL or greater, and if its CO emissions are above the CO emission limit at the given combustion turbine operating conditions, its VOC emissions shall be considered as occurring at a rate determined by the equation: $VOC_{actual} = VOC_{limit} \times (CO_{actual}/CO_{limit})$, pending the outcome of compliance testing, after which a VOC/CO correlation curve for CTG-3 will be developed and used for VOC compliance determination purposes.
	21. The Permittee shall monitor the natural gas and ULSD consumption of CTG-3 and DB (natural gas only) in accordance with 40 CFR Part 60 Subpart KKKK utilizing a fuel flow monitoring system as approved by MassDEP.

Table 7	
EU#	Monitoring and Testing Requirements
CTG-3/ HRSG-300	22. The Permittee shall monitor the sulfur content of the fuel combusted by CTG-3/HRSG-300 in accordance with 40 CFR Part 60 Subpart KKKK, or pursuant to any alternative fuel monitoring schedule developed in accordance with 40 CFR Part 60 Subpart KKKK.
	23. The Permittee shall install and operate continuous monitors fitted with alarms to monitor continuously the temperatures at the inlets to the SCR and oxidation catalysts serving CTG-3/HRSG-300. In addition, the Permittee shall monitor the combustion turbine inlet and ambient temperatures for CTG-3.
	24. The Permittee shall monitor the load, start-up and shutdown duration, and mass emissions (lb/event) during start-up and shutdown periods of CTG-3.
	25. The Permittee shall monitor the operation of CTG-3/HRSG-300, in accordance with the surrogate methodology or parametric monitoring developed during the most recent compliance test concerning PM, PM ₁₀ , and PM _{2.5} emission limits.
Facility- Wide	26. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	27. If and when MassDEP requires it, the Permittee shall conduct compliance testing in accordance with EPA Reference Test Methods and 310 CMR 7.13.

Table 7 Key:

EU# = Emission Unit Number
 EPA = United States Environmental Protection Agency
 CFR = Code of Federal Regulations
 CMR = Code of Massachusetts Regulations
 DAHS = Data Acquisition and Handling System
 CEMS = Continuous Emission Monitoring System
 SCR = Selective Catalytic Reduction
 O₂ = Oxygen
 NO_x = Nitrogen Oxides
 CO = Carbon Monoxide
 NH₃ = Ammonia
 PM₁₀ = Particulate Matter less than or equal to 10 microns in size
 PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in size
 VOC = Volatile Organic Compounds
 CO_{2e} = Greenhouse Gases expressed as Carbon Dioxide equivalent and calculated by multiplying each of the six GreenHouse Gases (Carbon Dioxide, Nitrous Oxide, Methane, Hydrofluorocarbons, Perfluorocarbons, Sulfur Hexafluoride) mass amount of emissions, in tons per year, by the gas's associated global warming potential published at Table A-1 of 40 CFR Part 98, Subpart A and summing the six resultant values.
 SO₂ = Sulfur Dioxide
 H₂SO₄ = Sulfuric Acid
 lb/hr = pounds per hour
 lb/mmBtu = pounds per million British thermal units
 ppmvd = parts per million by volume, dry basis
 scf = standard cubic feet
 mmBtu/hr = million British thermal units per hour
 mmBtu = million British thermal units

HHV = higher heating value basis
 MECL = Minimum Emissions Compliance Load
 ULSD = Ultra Low Sulfur Diesel Fuel Oil containing a maximum of 0.0015 weight percent sulfur

Table 8	
EU#	Record Keeping Requirements
CTG-3/ HRSG-300	<p>1. The Permittee shall maintain records of CTG-3/HRSG-300’s hourly fuel heat input rate (mmBtu/hr, HHV), total fuel heat input (mmBtu), and natural gas consumption (scf) and ULSD (gal) per month and twelve month rolling period basis.</p> <p>2. The Permittee shall maintain records of each date and daily hours of operation and total hours of operation of CTG-3/HRSG-300 per month and twelve month rolling period.</p> <p>3. The Permittee shall maintain on-site permanent records for a period of 5 years of output from all continuous monitors (including CEMS) for flue gas emissions and natural gas consumption (scf).</p> <p>4. The Permittee shall maintain a log to record problems, upsets or failures associated with the subject emission control systems, DAHS and CEMS, serving this emission unit.</p> <p>5. The Permittee shall continuously estimate and record VOC emissions on the DAHS using the CO/VOC correlation curve developed from the most recent compliance test.</p> <p>6. The Permittee shall continuously estimate and record PM, PM₁₀, and PM_{2.5} emissions on the DAHS using the surrogate methodology or parametric monitoring derived from the most recent compliance test.</p> <p>7. The Permittee shall maintain records of the load, start-up and shutdown duration, and mass emissions (lb/event) during start-up and shutdown periods of CTG-3/HRSG-300.</p> <p>8. The Permittee shall maintain records of the sulfur content of the fuel combusted by CTG-3 and DB at the frequency required pursuant to 40 CFR Part 60 Subpart KKKK, or pursuant to any alternative fuel monitoring schedule issued in accordance with 40 CFR Part 60 Subpart KKKK.</p> <p>9. The Permittee shall maintain continuous records of SCR and oxidation catalyst inlet temperatures, combustion turbine inlet temperatures and ambient temperatures.</p> <p>10. The Permittee shall maintain the SOMP for the urea handling system serving CTG-3/HRSG-300 in a convenient location and make them readily available to all employees.</p> <p>11. The Permittee shall maintain a copy of this Plan Approval, underlying Application, and the most up-to-date SOMP for CTG-3/HRSG-300.</p>

Table 8	
EU#	Record Keeping Requirements
Facility-Wide	<p>12. A record keeping system for the Facility shall be established and maintained up-to-date by the Permittee such that year-to-date information is readily available. Record keeping shall, at a minimum, include:</p> <p>a) Compliance records sufficient to document actual emissions from the Project in order to determine compliance with what is allowed by this Proposed Plan Approval. Such records shall include, but are not limited to, fuel usage rates, emissions test results, monitoring equipment data and reports;</p> <p>b) Maintenance: A record of routine maintenance activities performed on the subject emission units' control equipment and monitoring equipment at the Facility including, at a minimum, the type or a description of the maintenance performed and the date(s) and time(s) the work was commenced and completed; and,</p> <p>c) Malfunctions: A record of all malfunctions on the subject emission units' control and monitoring equipment for the Project and the Facility including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed.</p> <p>13. The Permittee shall maintain monthly records to demonstrate the Facility's compliance status regarding the Facility-Wide emission limits (TPY) specified in Table 6. Records shall include actual emissions for the month as well as for the previous 11 months. (The MassDEP approved format can be downloaded at http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping in Microsoft Excel format.)</p> <p>14. The Permittee shall maintain records for the annual preparation of a Source Registration/Emission Statement Form in accordance with 310 CMR 7.12.</p> <p>15. The Permittee shall maintain records of monitoring and testing as required by Table 7. All records required by this Plan Approval shall be kept on site for five (5) years and made available for inspection by MassDEP or EPA upon request.</p>

Table 8 Key:

EU# = Emission Unit Number
 PCD = Pollution Control Device
 SOMP = Standard Operating and Maintenance Procedures
 EPA = United States Environmental Protection Agency
 DAHS = Data Acquisition and Handling System
 CEMS = Continuous Emission Monitoring System
 SCR = Selective Catalytic Reduction
 CFR = Code of federal Regulations
 CMR = Code of Massachusetts Regulations
 CO = Carbon Monoxide
 NH₃ = Ammonia

PM = Particulate Matter
 PM₁₀ = Particulate Matter less than or equal to 10 microns in size
 PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in size
 VOC = Volatile Organic Compounds
 SO₂ = Sulfur Dioxide
 CO₂ = Carbon Monoxide
 ULSD = Ultra Low Sulfur Diesel Fuel Oil containing a maximum of 0.0015weight percent sulfur
 lb = pounds
 scf = standard cubic feet
 MmBtu/hr = million British thermal units per hour
 MmBtu = million British thermal units
 HHV = higher heating value basis
 TPY = tons per 12-month rolling period

Table 9	
EU#	Reporting Requirements
CTG-3/ HRSG-300	<p>1. The Permittee must obtain written MassDEP approval of an emissions test protocol prior to initial compliance emissions testing of CTG-3/HRSG-300 at the Facility. The Permittee shall submit a pre-test protocol at least 30 days prior to the compliance emissions testing. The protocol shall include a detailed description of sampling port locations, sampling equipment, sampling and analytical procedures, and operating conditions for any such emissions testing. In addition, the protocol shall include procedures for: a) the required CO and VOC correlation for CTG-3/HRSG-300; and b) a parametric monitoring strategy to ensure continuous monitoring of PM, PM₁₀, and PM_{2.5} emission from CTG-3/HRSG-300.</p> <p>2. The Permittee shall submit a final emissions test results report to MassDEP within 45 days after completion of the initial compliance emissions testing program.</p> <p>3. A QA/QC program plan for the CEMS serving CTG-3/HRSG-300 must be submitted so as to conform with 40 CFR Part 60 Appendices B and F., in writing, at least 30 days prior to commencement of commercial operation of the subject emission units. MassDEP must approve the QA/QC program prior to its implementation. Subsequent changes to the QA/QC program plan shall be submitted to MassDEP for MassDEP approval prior to their implementation.</p> <p>4. The Permittee shall submit a quarterly Excess Emissions Report to MassDEP by the thirtieth (30th) day of April, July, October, and January covering the previous calendar periods of January through March, April through June, July through September, and October through December, respectively. The report shall contain at least the following information:</p> <p>a) The Facility CEMS excess emissions data, in a format acceptable to MassDEP.</p>

Table 9	
EU#	Reporting Requirements
CTG-3/ HRSG-300	<p>b) For each period of excess emissions or excursions from allowable operating conditions for the emission unit(s), the Permittee shall list the duration, cause, the response taken, and the amount of excess emissions. Periods of excess emissions shall include periods of start-up, shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or CEMS. (“Malfunction” means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions. “Emergency” means any situation arising from sudden and reasonably unforeseeable events beyond the control of this source, including acts of God, which situation would require immediate corrective action to restore normal operation, and that causes the source to exceed a technology based limitation under the Plan Approval, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operations, operator error or decision to keep operating despite knowledge of these things.)</p> <p>c) A tabulation of periods of operation of each emission unit and total hours of operation of each emission unit during the calendar quarter.</p> <p>5. After completion of the initial compliance emissions testing program, the Permittee shall submit information for MassDEP review that documents the actual emissions impacts generated by CTG-3/HRSG-300 during start-up and shutdown periods. This information shall be submitted to MassDEP as part of the final emissions test results report.</p> <p>6. The Permittee shall submit to MassDEP, in accordance with the provisions of Regulation 310 CMR 7.02(5)(c), plans and specifications for CTG-3/HRSG-300 and duct burner, the SCR control system, the oxidation catalyst control system, and the CEMS, and DAHS once the specific information has been determined, but in any case not later than 30 days prior to commencement of construction/installation of each component of the emission unit.</p> <p>7. The Permittee shall submit, in writing, the following notifications to MassDEP within fourteen (14) days after each occurrence:</p> <ul style="list-style-type: none"> a) date of commencement of construction of the CTG-3/HRSG-300; b) date when construction has been completed the CTG-3/HRSG-300; c) date of initial firing of the CTG-3/HRSG-300; d) date when the CTG-3/HRSG-300 is either ready for commercial operation or has commenced commercial operation.

Table 9	
EU#	Reporting Requirements
CTG-3/ HRSG-300	8. The Permittee shall submit an application for a significant modification to the Facility’s Operating Permit at least nine (9) months prior to the planned modification. The Permittee may commence construction of the Project. However operation of the proposed equipment cannot occur prior to final approval of the modification to the Operating Permit.
	9. The Permittee must notify MassDEP by telephone or fax or e-mail [nero.air@massmail.state.ma.us] as soon as possible, but in any case no later than three (3) business days after the occurrence of any upsets or malfunctions to the CTG-3/HRSG-300 equipment, air pollution control equipment, or monitoring equipment which result in an excess emission to the air and/or a condition of air pollution.
Facility- Wide	10. If the Facility is subject to 40 CFR Part 68, due to the presence of a regulated substance above a threshold quantity in a process, the Permittee must submit a Risk Management Plan no later than the date the regulated substance is first present above a threshold quantity.
	11. The Permittee shall comply with all applicable reporting requirements of 310 CMR 7.71 (Reporting of Greenhouse Gas Emissions), and 40 CFR Part 98 (Mandatory Greenhouse Gas Emissions Reporting).
	12. The Permittee shall submit a semi-annual report to MassDEP by July 30 and January 30 of each year to demonstrate the Facility’s compliance status regarding the Facility-Wide emission limits (TPY) specified in Table 6. Reports shall include actual emissions for the previous 12 months. (The MassDEP approved format can be downloaded at http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping in Microsoft Excel format.)
	13. The Permittee shall submit to MassDEP a SOMP for the Project and associated control and monitoring/recording systems at the Facility no later than 30 days prior to commencement of commercial operation of the unit. Thereafter, the Permittee shall submit updated versions of the SOMP to MassDEP no later than thirty (30) days prior to the occurrence of a significant change. MassDEP must approve of significant changes to the SOMP prior to the SOMP becoming effective. The updated SOMP shall supersede prior versions of the SOMP.
	14. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a “Responsible Official” as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).

Table 9	
EU#	Reporting Requirements
Facility-Wide	<p>15. All notifications and reporting to MassDEP required by this Plan Approval shall be made to the attention of:</p> <p style="padding-left: 20px;">Department of Environmental Protection/Bureau of Air and Waste 205B Lowell Street Wilmington, Massachusetts 01887 Attn: Permit Chief Phone: (978) 694-3200 Fax: (978) 694-3499 E-Mail: nero.air@massmail.state.ma.us</p> <p>16. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval.</p> <p>17. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within thirty (30) days from MassDEP’s request.</p>

Table 9 Key:

- EU# = Emission Unit Number
- EPA = United States Environmental Protection Agency
- CEMS = Continuous Emission Monitoring System
- DAHS = Data Acquisition and Handling System
- CFR = Code of Federal Regulations
- CMR = Code of Massachusetts Regulations
- M.G.L. = Massachusetts General Laws
- SOMP = Standard Operating and Maintenance Procedures
- QA/QC = Quality Assurance/Quality Control
- CTG = Combustion Turbine Generator
- SCR = Selective Catalytic Reduction
- TPY = tons per 12 month rolling period
- NO_x = Oxides of Nitrogen
- CO = Carbon Monoxide
- NH₃ = Ammonia
- PM = Particulate Matter
- PM₁₀ = Particulate Matter less than or equal to 10 microns in size
- PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in size
- VOC = Volatile Organic Compounds
- NAAQS = National Ambient Air Quality Standards
- SILs = Significant Impact Levels
- AAL = Allowable Ambient Limit
- TEL = Threshold Effects Exposure Limit

7. SPECIAL TERMS AND CONDITIONS

A. SPECIAL TERMS AND CONDITIONS

The Project is subject to, and the Permittee shall ensure that the Project shall comply with, the special terms and conditions as contained in Table 10 below:

Table 10	
EU#	Special Terms and Conditions
CTG-3/ HRSG-300	1. The Permittee shall not combust ULSD fuel unless: <ul style="list-style-type: none"> a. natural gas is curtailed by the natural gas supplier or distributor; b. instructed/mandated by the system operator, ISO New England; c. conducting emissions testing; or d. conducting required equipment maintenance and testing.
	2. The Permittee is restricted to a maximum annual fuel usage for ULSD of 878,400 gallons per 12-month rolling period for CTG-3.
	3. The Permittee shall not allow CTG-3 to operate below the MECL, except for start-ups and shutdowns. Emissions during all operating conditions, including start-ups and shutdowns shall be included in the 12 month rolling total limits (TPY) specified in Table 6.
	4. The Permittee shall ensure that the SCR control equipment serving CTG-3/HRSG-300 is operational whenever the turbine exhaust temperature at the SCR unit attains the minimum exhaust temperature specified by the SCR vendor and other system parameters are satisfied for SCR operation. The specific time period required to achieve this exhaust temperature and other system parameters will vary based on ambient conditions and whether the start-up is cold, warm, or hot.
	5. The Permittee shall develop as part of the Standard Operating Procedures for CTG-3/HRSG-300, an MECL optimization protocol to establish minimum operating load(s) that maintain compliance with all emission limitations.
	6. The Permittee shall maintain an adequate supply of spare parts on-site to maintain the on-line availability and data capture requirements for the CEMS equipment serving the CTG-3/HRSG-300.
	7. The Permittee shall properly train all personnel to operate CTG-3/HRSG-300 and the control and monitoring equipment serving the Project in accordance with vendor specifications. All persons responsible for the operation of the Facility shall sign a statement affirming that they have read and understand the approved SOMP. Refresher training shall be given by the Permittee to Facility personnel at least once annually.
Facility- Wide	8. The Permittee shall comply with all provisions of 40 CFR Part 60, 40 CFR Part 63, 40 CFR Part 64, 40 CFR Part 68, 40 CFR Part 98, and 310 CMR 6.00 through 8.00 that are applicable to this Facility.
	9. All requirements of this Approval which apply to the Permittee shall apply to all subsequent owners and/or operators of the Facility.

Table 10 Key:

EU# = Emission Unit Number
 CFR = Code of federal regulations
 CMR = Code of Massachusetts Regulations
 SOMP = Standard Operating and Maintenance Procedures
 CEMS = Continuous Emission Monitoring System
 SCR = Selective Catalytic Reduction
 TPY = tons per 12 month rolling period
 MECL = Minimum Emissions Compliance Load

B. STACK INFORMATION

The Permittee shall maintain, and utilize exhaust stacks with the following parameters, as contained in Table 11 below, for the Emission Units that are regulated by this Plan Approval:

Table 11				
EU#	Stack Height Above Ground (feet)	Stack Inside Exit Effective Diameter (feet)	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (degrees Fahrenheit)
CTG-3/ HRSG-300	315 (concrete shell with 2 steel flues)	9.75 (each flue)	18.1 to 101	262 to 437 °F

Table 11 Notes:

CTG-3/HRSG-300 shall emit through one stack, containing two (2) flues.

Table 11 Key:

EU# = Emission Unit Number
 °F = degrees Fahrenheit

C. SOUND

Daytime and nighttime sound measurements to determine ambient (background) sound levels were taken at twelve locations (Table 12). Baseline sound measurements were taken on March 28, 2014. During the measurement time period, MATEP was operating the following equipment: CTG-1/HRSG-100, CTG-2/HRSG-200, three gas compressors, cooling tower cells (CTC) 6, 7, and 8 and rooftop fans. The sound measurements consisted of both A-weighted sound levels and octave band sound levels. A-weighted sound levels emphasize the middle frequency sounds and de-emphasize lower and higher frequency sounds, and are reported in decibels designated as “dBA”. The A-weighted sound levels were recorded for each of the five categories most commonly used to describe ambient environments: L₉₀, L₅₀, L₁₀, L_{max}, and L_{eq}. The L₉₀ level represents the sound level exceeded 90 percent of the time and is used by MassDEP for determining background (ambient) sound levels.

In general, background (L_{90}) levels (in dBA) at twelve locations, which are given in Table 12 below, the background levels ranged from 57 to 67 during nighttime hours.

Calculations of operational acoustic impacts from the Facility were calculated using DataKustic’s CadnaA noise calculation software, a computer-aided noise abatement program. CadnaA conforms to International Standard ISO-9613.2, “Acoustics – Attenuation of Sound during Propagation Outdoors.” The site-wide noise model was developed for the plant using the primary sources of noise from the Project, which include the following pieces of equipment: turbine generator package, the turbine air inlet, the turbine exhaust stack, the enclosure intake and discharge vents, the gas compressor cooling equipment and the gas compressor. The method evaluated A-weighted sound pressure levels under meteorological conditions favorable to propagation from sources of known sound emissions.

The impact sound levels generated from base load (100% load) operation of the Project modeled by the Permittee are summarized in Table 12 below:

Table 12				
Location	Ambient (L_{90},dBA)¹	Modeled Project Only Sound Level (dBA)	Combined Project and Ambient Sound Level (dBA)	Increase Over Ambient (dBA)²
ST1 – Located on the sidewalk at corner of Shattuck and Binney Streets	67	62	68	1
ST3 - Located on the sidewalk at Brookline Avenue opposite middle of CTC #1	62	62	65	3
ST4 – Located on the sidewalk at Brookline Avenue opposite plant	60	62	64	4
ST5 – Located on the sidewalk at corner of Brookline Avenue and Francis Street opposite CTC #7	62	62	65	3
ST8 – Located on the sidewalk at corner of Brookline Avenue and Francis Street	57	62	63	6

Table 12				
Location	Ambient (L₉₀,dBA)¹	Modeled Project Only Sound Level (dBA)	Combined Project and Ambient Sound Level (dBA)	Increase Over Ambient (dBA)²
ST9 – Located on the sidewalk on Francis Street opposite of middle CTC	59	67	67	8
S10 – Located on the sidewalk on Francis Street opposite MATEP stack	62	69	70	8
ST12 Located on the sidewalk at corner of Francis and Binney Streets, diagonally opposite MATEP	61	66	67	6
ST14 – Located on the sidewalk at corner of Francis and Binney Streets, across the street from MATEP	62	67	68	6
ST15 – Located on the sidewalk in front of 52 Francis Street house	57	62	64	7
ST16 – Located on the sidewalk in front of 57 Fenwood Road house	57	45	57	0
ST17 – Located on the sidewalk at corner of Binney Street and alley between MATEP and Smith buildings	66	64	68	2

Table 12 Notes:

1. The background levels observed during equipment operating hours either nighttime or daytime where the sound level is exceeded 90 percent of the time (L₉₀) which is the level regulated by MassDEP Noise Policy 90-001.
2. MassDEP Noise Policy 90-001 limits sound level increases to no more than 10 dBA over the L₉₀ ambient levels. Pure tone conditions or tonal sounds, defined as any octave band level which exceeds the levels in adjacent octave bands by 3 dBA or more, are not allowed.

Table 12 Key:

L₉₀ = sound level exceeded 90 percent of the time
 dBA = decibels, A-weighted
 CTC = Cooling Tower Cell

Table 13	
Sound/Noise Attenuation and Survey	
CTG-3/ HRSG- 300	<p>1. The Project shall be operated and maintained such that at all times:</p> <ul style="list-style-type: none"> a) No condition of air pollution shall be caused by sound as provided in 310 CMR 7.01. b) No sound emissions resulting in noise shall occur as provided in 310 CMR 7.10 and MassDEP’s Noise Policy 90-001. MassDEP’s Noise Policy 90-001 limits increases over the existing L₉₀ background level to 10 dBA. Additionally, "pure tone" sounds, defined as any octave band level which exceeds the levels in adjacent octave bands by 3 dBA or more, are also prohibited. The Permittee, at a minimum, shall ensure that the Facility complies with said Policy.
	<p>2. Facility personnel shall continue to identify and evaluate all plant equipment that may cause a noise condition. Sound sources from the Project with potential to cause noise include, but are not limited to: gas turbine package, gas turbine air inlet, gas turbine stack exhaust, turbine enclosure vent, gas compressor cooling equipment, and gas compressor.</p>
	<p>3. The Permittee shall perform the following measures or equivalent alternative measures for the Project to minimize sound emissions as indicated in the Application with regard to noise mitigation:</p> <ul style="list-style-type: none"> a) The gas turbine generator package shall be housed below-grade within a turbine room at the existing Facility. The combustion air will be drawn in through an air filter and air inlet silencer located on the roof. The gas turbine enclosure will include a ventilation system that includes exhaust silencing. b) The gas turbine generator package shall exhaust into a Heat Recovery Steam Generator (HRSG) before exiting the facility through combustion exhaust ducting connected to the existing two-flue stack. Sound levels radiating out the top of the stack approximately 315 feet above ground level are included in the acoustical model as an elevated sound source. c) Cooling air for the turbine enclosure shall be drawn from inside the existing building and exhausted through a discharge ventilation duct penetration on the roof of the Facility. The exhaust duct shall be fitted with an appropriate discharge vent silencer.
	<p>4. The Permittee shall complete a sound survey in accordance with MassDEP procedures/guidelines within one hundred eighty (180) days after the Project commences commercial operation, while the Facility is in operation, to verify that sound emissions from the Project do not exceed the predicted levels. The Permittee shall submit a sound survey protocol at least 30 days prior to commencing the sound survey for MassDEP review and approval. The Permittee shall submit to MassDEP a written report, describing the results of the required sound survey, within 45 days after its completion.</p>

8. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and/or EPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.
- F. Should there be any differences between the Application and this Proposed Plan Approval, the Proposed Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Proposed Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. The Permittee shall conduct emission testing, if requested by MassDEP, in accordance with EPA Reference Test Methods and regulation 310 CMR 7.13. If required, a test protocol

report shall be submitted to MassDEP at least 30 days prior to emission testing and the final test results report shall be submitted within 45 days after emission testing.

K. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

9. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

The Project was also subject to the requirements of the Massachusetts Environmental Policy Act (MEPA) Massachusetts General Laws (M.G.L.) Chapter 30, Sections 61-62I and Section 11.08 of the MEPA regulations at 301 CMR 11.00. MATEP LP submitted to the Executive Office of Energy and Environmental Affairs (EOEEA), Massachusetts Environmental Policy Act (MEPA) Office an expanded environmental notification form (EENF), dated December 16, 2014, and a Single Environmental Impact Report (SEIR), dated May 7, 2015. These documents addressed various environmental media impacts including an air toxics evaluation with an air dispersion modeling study. On June 26, 2015, the Secretary of the Executive Office of Energy and Environmental Affairs issued a certificate that the Single Environmental Impact Report (SEIR) (EEA #15297) adequately and properly complied with the MEPA and its implementing regulations.

10. SECTION 61 FINDINGS

Mitigation and Draft Section 61 Findings

The Single EIR contained draft Section 61 Findings associated with each separate State Agency Action identified for the Project.

The Project includes the following mitigation measures to avoid, minimize, and mitigate impacts from the Project:

Air Pollution

- Use of a high-efficiency CHP technology, and emission controls to minimize all pollutants;
- Use of CEMS and Data Acquisition and Handling Systems (DAHS) reporting equipment to minimize NOX, CO, and NH₃;
- Use of COMS and DAHS reporting equipment to minimize opacity (from the Facility's main stack);
- Use of natural gas with ULSD backup to limit emissions of PM, SO₂, and HAPs compared to other fossil fuels;
- Use of Dry Low NOX turbine combustors in combination with SCR to reduce NOX emissions; and

- Advanced combustor design, combustor practices, and use of a catalytic oxidation system in the HRSG to reduce emissions of CO and VOCs.

GHG Emissions

- Use of CHP technology;
- Commitment to evaluate the installation of a variable frequency drive (VFD) motor on the natural gas compressor for the project, and to include such a drive if technically and economically feasible; and
- Certification to the MEPA Office indicating that all of the measures to mitigate GHG emissions, or measures that will achieve equivalent reductions, are included in the project.

Noise

- Placement of generation equipment in the basement inside the MATEP building, which was originally designed for noise mitigation with concrete and brick construction;
- Placement of generation equipment such that there will be no net direct openings (doors, windows, or louvers) from the locations of the new noise-generating equipment to the outside;
- Control of noise from roof-mounted equipment through equipment placement, silencers, and noise control barriers (roof screen extensions); and
- Use of silencers for the turbine air inlet and enclosure discharge vents.

Construction Period

- Adherence to Construction Management Plan;
- Use of the existing unloading areas (off Binney Street and Francis Street) to the maximum extent feasible;
- Staging materials within the facility, on the roof, or at off-site storage facilities;
- Source controls for construction equipment noise, including properly operating noise muffler systems;
- Appropriate traffic management; and
- Minimization of noise-generating off-hour work to the extent practicable.

The Proponent commits to funding all of the mitigation measures discussed in the Section 61 Findings. The implementation schedule will ensure mitigation is implemented prior to or when appropriate in relation to environmental impacts.

Section 61 Findings

Based upon its review of the MEPA documents, the Application and supplemental information submitted to date, and MassDEP's regulations, MassDEP finds that the terms and conditions of this Plan Approval constitute all feasible measures to avoid damage to the environment and will minimize and mitigate such damage to the maximum extent practicable. Implementation,

compliance and enforcement of the mitigation measures will occur in accordance with the terms and conditions set forth in this Plan Approval.

11. PUBLIC PARTICIPATION

This Plan Approval is subject to a public comment period. Attached is a Public Notice. Please have the attached Public Notice published as instructed at your expense in newspapers of general circulation in the municipalities where the modifications are proposed. A minimum thirty (30) day public comment period will commence with the date of publication of the Public Notice. MATEP should forward proof of publication to the attention of the Permit Chief, Bureau of Air and Waste, at the address shown on this letterhead to avoid delays in processing your submittal. In addition to providing for a public comment period, MassDEP will hold a public hearing on the Proposed Plan Approval, the details of which are stated in the attached Public Notice.

[Note: the Notice was published in today's Environmental Monitor, April 20, 2016. MATEP is publishing the Notice in several publications and languages.]

Sincerely,

Edward J. Braczyk
Environmental Engineer

Joseph Su
Environmental Engineer

Susan P. Ruch
Acting Permit Section Chief and
Deputy Regional Director
Bureau of Air and Waste

**This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.**

Enclosures:

Notice of Public Hearing and Public Comment Period & Section 61 Findings
Communications for Non-English Speaking Parties

cc: Peter E. Gluckler, Jr., EH&S Manager, MATEP
A.J. Jablonowski, Epsilon Associates, 3 Clocktower Place, Suite 250, Maynard, MA 01453
Boston Public Health Commission, 1010 Massachusetts Ave, 6th Floor, Boston, MA
Parker Hill Branch of the Boston Public Library, 1497 Tremont Street, Boston, MA
Fire Headquarters, 115 Southampton Street, Boston, MA 02118
City Hall, One City Hall Square, Boston, MA 02201
Metropolitan Area Planning Council, 60 Temple Place, Boston, MA 02111
Deirdre Buckley, MEPA, Executive Office of Energy and Environmental Affairs, 100 Cambridge Street,
Suite 900, Boston, MA 02114
John Ballam, Department of Energy Resources, 100 Cambridge Street, Suite 1020, Boston, MA 02114
United States Environmental Protection Agency (EPA) – New England Regional Office,
5 Post Office Square, Suite 100, Mail Code OEP05-2, Boston, Massachusetts 02109-3912
Attn: Air Permits Program Manager

ecc: EPA: Donald Dahl
MassDEP/Boston: Yi Tian
MassDEP/WERO: Marc Simpson
MassDEP/CERO: Roseanna Stanley
MassDEP/SERO: Thomas Cushing
MassDEP/NERO: Susan Ruch
MassDEP/NERO: Ed Braczyk
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MassDEP/NERO: Martha Bolis
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